

What is claimed is:

1. A method of polishing a work surface having protrusions and depressions thereon with slurry containing particles,
5 comprising the steps of:
 forming aggregation trace within said depression by
collectingsaidparticlesofsaidslurrywithirradiatinglaser
light to said depression existed adjacent to or in the vicinity
of said protrusion where a selectively larger removal material
10 amount is desired during polishing process, whereby regions
having said aggregation trace become substantially same height
as said protrusions; and
 planarizing by polishing said regions having said
aggregation trace and said protrusions together so as to remove
15 a substantially uniform material amount.
2. The method of polishing according to claim 1, wherein
said aggregation trace of said particles are formed within
said depression of said work surface by determining a path
20 on which laser light flux moves in accordance with the shape
of the protrusions and depressions of said work surface to
perform scanning.
3. The method of polishing according to claim 1, wherein
25 said aggregation trace of said particles are formed within
said depression of said work surface by laser light irradiation
through a light shield mask, said light shield mask is arranged
in accordance with the shape of said protrusions and
depressions of the work surface and placed in a path of laser
30 light.

4. The method of polishing according to any one of claims
1 to 3, wherein said aggregation trace of said particles are
formed in a region irradiated with laser light of said work
surface by trapping and collecting said particles of said
5 slurry through a laser trapping phenomenon with light radiation
pressure, said formed aggregation trace of said particles are
broken by polishing and said particles are used as polishing
particles, so that said particles are concentrated near said
region irradiated with laser light, whereby an amount of
10 removal material by polishing near said aggregation trace of
said particles is increased.

5. The method of polishing according to any one of claims
1 to 4 wherein: the shape of a surface of a region to be polished
15 on said work surface is measured and stored before or during
polishing; a laser light irradiation region, an irradiation
condition, and a polishing condition are calculated from the
measurement data; and laser light irradiation is performed
in accordance with the calculation results.

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6. A polishing apparatus for polishing a work surface having
protrusions and depressions thereon with slurry containing
particles, comprising:

25 a laser optical system for projecting and irradiating
laser light; and

a polishing tool system for performing press in an axis
direction and rotational movement,

wherein said irradiation of laser light and polishing
are performed on said depressions adjacent to said protrusions
30 on said work surface simultaneously and sequentially by
relative movement of said laser optical system and said

polishing tool system to said work surface.

7. The polishing apparatus according to claim 6, wherein:
the shape of said surface of said region to be polished on
5 said work surface is measured by shape measuring means before
or during polishing; the measured shape is stored by storing
means; a laser light irradiation region, an irradiation
condition, and a polishing condition are calculated from the
stored measurement data; and based on the calculation result,
10 said laser optical system irradiates laser to said depressions
adjacent to said protrusions or said polishing tool system
polishes said protrusions and said depressions.

8. The polishing apparatus according to claim 6, wherein
15 a light shield mask is placed in an optical path of said laser
optical system in order to irradiate laser light selectively
in accordance with the shape of said protrusions and said
depressions of said work surface.